# Appendix D: Computing Rates

According to Webster's New Collegiate Dictionary, a *Rate* is:

- a quantity, amount, or degree of something
- measured per unit of something else

In public health, we commonly use rates that are the number of health events (such as motor vehicle crash deaths or influenza cases) per some number of persons in the population. Examples of rates commonly used in public health include the following:

- 35.5% of Hispanic or Latino persons in Utah do not have health insurance coverage (a percent is the quantity per 100)
- 52.9 diabetes deaths per 100,000 Utah Pacific Islanders
- 8.4 infant deaths per 1,000 births among Black/African American mothers

In the above examples, the rate has been expressed as the number of events per 100, 1,000 or 100,000 persons in the population. This is done as a convenience, so that we do not have to read and interpret small fractions. For instance, the diabetes deaths per 100,000 Pacific Islanders Utahns in the above example could also be expressed as .000529 risk per person. It is merely easier to read and compare the rate expressed as 52.9 per 100,000 persons.

The following table contains information on the number of coronary heart disease (CHD) deaths by race and ethnicity. The actual number of health events is not very useful because the populations are so different in size. Many more deaths are expected in the White race group because Utah's White population is much larger than the others. Calculated rates make a meaningful comparison across racial and ethnic groups possible.

Utah Coronary Heart Disease Deaths, 2004-2008

| | Average annual # deaths | Total 2006 population | Crude rate per 100,000 persons |
|---|---|---|---|
| All Utahns | 1,548 | 2,615,129 | 59.2 |
| American Indian/AK Native | 10 | 37,002 | 27.0 |
| Asian | 13 | 56,736 | 22.9 |
| Black/African American | 9 | 33,663 | 26.7 |
| Native HI/Pacific Islander | 7 | 21,538 | 33.4 |
| White | 1,509 | 2,466,190 | 61.2 |
| Hispanic/Latino | 49 | 294,552 | 16.5 |
| Non-Hispanic | 1,500 | 2,320,577 | 64.6 |

Rates are calculated using a simple formula. For instance, for Asians in the above table, there were 65 heart disease deaths during 2004-2008 (five years), or an average of 13 annual deaths. There were 56,736 persons in the population.

Computation: 13 / 56,736 = .000229 (risk per person)

The rate is multiplied by 100,000 to make it easier to read, and the result is 22.9 per 100,000 persons.